Ice Lantern

Kit contains:

- Balloons
- Mini glowsticks

You will need: scissors, a table knife, and your winter gear (it's cold outside).

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INSTRUCTIONS

Step 1. Fill your water balloons in the sink. You may wish to experiment by making some balloons bigger and others smaller.

Step 2. Freeze the balloons for several hours. You can do this outside if the weather is below freezing or in your freezer if it is not. They are ready when you feel a solid shell of ice beneath the balloon and sloshy water in the middle.

Step 3. Bring your frozen balloons back to the sink. Use scissors to cut the balloons. Then peel the latex off the ice orbs.

Step 4. Drain the water from your ice orbs. Poke a hole with your finger or, if they're super frozen, a dull table knife. (It's quite possible for the orbs to spring a leak on their own.) If the holes are smaller than an inch in diameter, enlarge them as needed. It's okay if the holes end up bigger.

Step 5. Bring your ice orbs outside when it's dark. Snap and shake your glowstick to activate. Place it inside of the ice orbs, through the drainage holes, and watch them glow.

A SCIENTIFIC CURIOSITY

In the 1960s, a Tanzanian schoolboy named Erasto Mpemba noticed during a cooking class that if you put a hot ice cream mixture and a cooled ice cream mixture into the freezer, the hot one froze faster. Fascinated, he repeated the experiment with water.

A few years later, a physics professor named Dennis Osborne visited his secondary school. Erasto asked him, “If you take two beakers with equal volumes of water, one at 35°C and the other at 100°C and put them into a refrigerator, the one that started at 100°C freezes first. Why?” The other children laughed at the question, but Dr. Osborne went home and experimented. He also observed that this sometimes happens. Result: Dennis Osborne and Erasto Mpemba co-authored a paper about the **Mbemba effect**, which is what we call the **observation** that hot water can freeze faster than the same cold liquid under similar conditions.

For the last 50 years, scientists have been experimenting to prove or disprove the Mbemba effect. The answer is no, but yes? It’s possible to reliably make hot water freeze faster, but it requires specialized interventions. Hooray for curious kids!

https://iopscience.iop.org/article/10.1088/0031-9120/4/3/312/pdf

https://royalsocietypublishing.org/doi/10.1098/rspa.2019.0829

https://physicsworld.com/a/experiments-pin-down-conditions-that-make-hot-water-freeze-before-cold